ing both socially and intellectually. The charm of his personality depended on the fact that, happy as he was himself in living, he was still happier in making his life a blessing to others.

Mr. A. H. Hiorns, who died on April 17, was for many years head of the metallurgical department of the Birmingham Municipal Technical School. He commenced teaching metallurgy about 1875 in branch evening classes under the auspices of the Birmingham and Midland Institute. Later he was transferred to the central school, and was so successful as a teacher that he was granted leave of absence in 1882 and 1883 to study at South Kensington under Sir W. Roberts-Austen. On his return to Birmingham he organised a new metallurgical department at the Birmingham and Midland Institute. As the work expanded, it was transferred to the Birmingham Municipal Technical School, where the enthusiasm and geniality of Mr. Hiorns gathered an ever-increasing number of students. Mr. Hiorns contributed papers on metallurgical subjects to various scientific societies, but was best known as the author of a number of students' text-books, which have had a wide circulation, and include "Practical Metallurgy and Assaying," "Metallography," "Metal Colouring," "Iron and Steel," "Mixed Metals," etc. He retired from teaching some eight years ago, and the latter part of his life was spent chiefly in rural pursuits.

T. T.

Mr. T. W. Backhouse, of West Hendon House Observatory, Sunderland, who died on March 13 in his seventy-eighth year, devoted a large part of his life to scientific pursuits, and carried on for more than sixty years a series of meteorological and astronomical observations. He was a frequent contributor to our correspondence columns, and a most successful student of those minute differences in the appearance of the sky or of the atmosphere that escape untrained observers, who prefer to consult the barometer rather than natural phenomena. Four volumes of Publications were issued by him from his observatory, and the last, in 1915, summed up the accumulated records, extending over fifty years, of his skill and vigilance as an observer. In 1912 Mr. Backhouse published a valuable new catalogue of 9842 stars, containing all stars conspicuous to the naked eye. The catalogue was designed specially to afford assistance in the observation of meteors, to which Mr. Backhouse himself gave much attention; but it has been found useful by many other astronomers. His last communication was on the subject of the January meteors (Quadrantids) of 1917 (Nature, vol. c., p. 313). Mr. Backhouse became a fellow of the Royal Astronomical Society in 1873, and of the Royal Meteorological Society in 1892.

Notes.

The Prince of Wales having graciously consented to be nominated as an honorary fellow of the Royal Society of Edinburgh, the nomination was made at the last ordinary meeting on May 3, and the election will be carried out, according to regulation, at the ordinary meeting to be held on June 7.

The Croonian lecture of the Royal Society will be delivered by Prof. W. Bateson on June 17 upon the subject of "Genetic Segregation."

Mr. J. H. Lester has been elected chairman of the chemical section of the Manchester Literary and Philosophical Society for the session 1920–21.

Notice is given by the Chemical Society that applications for grants from the society's research fund must be made, on forms supplied, to the assistant secretary, Chemical Society, Burlington House, W.1, on or before June 1.

Mr. Wilfred H. Parker has been appointed director of the National Institute of Agricultural Botany. The institute, including the Official Seed-testing Station for England and Wales (the director of which is Mr. Saunders), will be housed at Cambridge in a large building which will be completed by next summer. Meanwhile the temporary office of the institute is at 72 Victoria Street, London, S.W.1.

The Salters' Institute of Industrial Chemistry invites applications for fellowships of the annual value of 250*l.* from those who in October next will have completed three years' training in chemistry and desire ultimately to enter upon an industrial career. The applications, including particulars of the candidates' training and war service, must be sent to the director of the institute, Salters' Hall, St. Swithin's Lane, E.C.4, by, at latest, July 1.

A report by Dr. A. Mearns Fraser, Medical Officer of Health for Portsmouth, upon the prevention of venereal diseases was noticed in Nature of March 25 (p. 114). The Society for the Prevention of Venereal Disease now informs us that the Portsmouth Borough Council has decided that steps shall be taken to educate the male inhabitants of the borough in the facts put forward by Dr. Fraser as to methods of prevention by immediate self-disinfection.

Scientific visitors to the Royal Academy's exhibition this year will be much interested in the fine presentation portrait of Sir Clifford Allbutt painted by Sir William Orpen. The picture hangs in the first gallery and bears the inscription: "Sir Clifford Allbutt, K.C.B., M.D., F.R.S., Regius Professor of Physic in the University of Cambridge; President of the British Medical Association. Presented to him by his Profession, 1920." A proof of the mezzotint engraving of the portrait is exhibited in the room devoted to engravings, drawings, and etchings.

The Department of Scientific and Industrial Research announces that the third Conference of Research Organisations will be held to-morrow, May 14, at 3 p.m. in the lecture theatre of the Institution of Civil Engineers, Great George Street, Westminster. An introductory address will be given by the Marquess of Crewe, who will be chairman of the conference, and it will be followed by papers on "The Relation of Research Associations to Existing Institutions for Research," by Dr. A. W. Crossley, and on "The Staffing of Research Associations: Salaries and Superannuation," by Mr. J. W. Williamson.

In an article in the *Times* for May 3 Mrs. Ayrton presents what must appear to be a formidable indictment of the War Office for neglect in regard to the use of the anti-gas fan. It is stated not only that there was great difficulty in getting the device considered, but also that, after its efficacy had been demonstrated, its adoption was delayed. Further, it is alleged that the supply of fans was never adequate, that the method of using them was never properly taught, and that to the last less efficacious measures were adopted in preference to the fan. It is suggested that this neglect on the part of the War Office entailed death to numbers and untold suffering to countless others. Many charges of grave neglect have been levelled against the War Office. The present one, however, is peculiar in being a charge, not against the military element, but rather against the experts who were associated with the Gas Service. It is well known that the Anti-Gas Service of the Army was, in the field, in the research laboratory, and on the instructional side, in most of the chief appointments, staffed by well-accredited men of science, and that both at the central laboratory in France and in London competent men were keenly on the alert to test and improve defensive measures. In view of this, it appears scarcely likely that Mrs. Ayrton's allegations will be accepted without question, and it is much to be desired that some plain statement of the facts should come from the men of science whose intelligence and humanity are implicity assailed in her article.

On the occasion of a luncheon given by the *Times* last week to celebrate the first attempt to fly from Cairo to the Cape, Dr. P. Chalmers Mitchell, who accompanied Capts. S. Cockerell and F. C. Broome as scientific observer, made some interesting remarks on the value of aviation in scientific exploration. The aviator has an opportunity denied to the explorer on land of seeing the general lie of the country and the broad features of its topography. The view of a large tract of country makes it possible to appreciate and explain features which would be puzzling when seen piecemeal or partially by the surface traveller. This applies particularly in a country such as Africa, where much detailed exploration has been done in places before the broader features are understood. Dr. Chalmers Mitchell believes that geographical and geological exploration will benefit widely by the use of aeroplanes. Another interesting point he emphasised was the unexpected number of natural aerodromes which the flight revealed. Several times when the machine was forced to make unexpected descents, suitable places were found. Dr. Chalmers Mitchell pointed out that a re-survey of the Cairo-Cape route from the air made in order to locate these natural aerodromes would save the cost of many intermediate stations that are being planned.

The trustees of the British Museum have arranged to purchase the whole of the collection of Lower Palæozoic fossils made in the Girvan district by Mrs. Robert Gray, of Edinburgh. The number of specimens is more than 38,000. Fossils from these rocks are scarcely represented at all in the British Museum, and very meagrely even in the Scottish museums. Apart from the specimens collected some fifty years ago by Mr. Robert Gray and now in the Hunterian Museum, Glasgow, there is little worth considering outside the present Gray collection. Mrs. Gray has diligently continued the work begun by her late husband, so that the whole series is admirably represented in her collection. She has also taken pains to get her material described, and it forms the foundation of a long series of memoirs. Noteworthy among these are the well-known work by Nicholson and Etheridge on "The Silurian Fossils of the Girvan District" (1878-80), the Palæontographical Society's monographs by Cowper Reed, W. K. Spencer, and Ida Slater, and the large memoirs in the Transactions of the Royal Society of Edinburgh by Reed and by Bather. In spite of these publications, the collection is known to contain undescribed material scarcely less in extent and importance. The situation of the rocks near the northern limit of the Ordovician and Silurian sea, and the richness of certain beds of a facies different from their representatives elsewhere, have led to the inclusion of a number of rare forms in the fauna. Among these are a new and strange cystid, Cothurnocystis; starfishes carrying back to the Ordovician plans of structure previously regarded as Devonian; echinoids among the oldest known and of a type hitherto unrecognised before the Upper Silurian; a remarkable edrioasteroid, Pyrgocystis; beautiful examples of the supposed cirripede, Turrilepas; and two new species of the very rare Helminthochiton.

The thirty-first annual Conference of the Museums Association will be held in Winchester on July 5-8, under the presidency of Sir Martin Conway, Director-General of the Imperial War Museum. The meeting this year is a joint conference with the French Museums Association, and among those who have signified their intention of attending are M. Hughes Leroux (senator), M. le Prof. Louis Roule (Paris Museum), M. le Prof. Vayssière (president of the French Museums Association), M. Fernand Guey (treasurer of the French Museums Association and director of the Museum of Fine Arts at Quimper), Dr. A. Loir (secretary of the French Museums Association), and a delegate from the French Association for the Advancement of Science. The mornings during the conference will be devoted to the reading and discussion of papers, and the afternoons to visits to places of special interest to museum workers. The subjects for discussion at the conference are: (1) The Public Libraries Act of 1919, and its effect on the future policy of museums; (2) the status and remuneration of museum curators and their staffs; and

(3) the desirability of a diploma for museum curators and the necessary course of training. In addition, the following papers have been promised: (1) "The Lighting of Picture Galleries and Museums," by Mr. Hurst Seager, vice-president of the New Zealand Institute of Architects; (2) "The Selection of Pictures for Municipal Art Galleries," by Mr. E. Howarth, curator of Sheffield Public Museums; and (3) "A Central Government Department for Museums and Art Galleries," by Dr. F. A. Bather. Mr. R. W. Hooley, Earlescroft, St. Giles's Hill, Winchester, has undertaken the duties of local secretary, and a small committee under the chairmanship of the Rev. S. A. McDowall, Winchester College, has been formed to arrange the programme of local visits.

THE next informal meeting of the Chemical Society will be held at Burlington House on Thursday, May 20, after the conclusion of the formal business of the ordinary scientific meeting. An exhibit demonstrating the methods of controlling soil organisms now being investigated at the Rothamsted Experimental Station will be shown by Mr. and Mrs. D. J. Matthews. This exhibit will include specimens of the soil organisms and the cultivation of these on artificial media. The effect of toxic substances on organisms and of the relationship of chemical composition to toxicity, with specimens illustrating effective doses of certain typical substances with a given quantity of soil, will also be shown. Dr. Marie Stopes will exhibit specimens and microscopic slides of fusain, durain, clarain, and vitrain, the four main constituents of banded bituminous coal. Mr. E. R. Thomas will show some experiments illustrating the influence of temperature, concentration, solvent, constitution, and catalyst on the rate of chemical change.

A SHORT article in our issue of March 11, p. 56, describing a magnetic disturbance which occurred on March 4–5, mentioned that aurora had been observed at Aberdeen on March 4, but considerably earlier than the commencement of the disturbance, and so presumably not directly connected with it. This seems to have been the only observation of aurora in this country on either March 4 or 5. A letter, however, which we have received from Prof. A. S. Eve, of Montreal, mentions a brilliant aurora as having been observed there between 1 a.m. and 2 a.m. G.M.T. on March 5, and so synchronous with the magnetic storm. Commencing with isolated patches, the aurora appeared for a short time in the form of an arc, and ended in a curtain display. This incident leads Prof. Eve to inquire whether there is in existence "an organisation for recording, with accurate timing, auroræ in both northern and southern hemispheres, and, if so, where can the records be obtained?" So far as we are aware, no such records exist. The question seems to merit the consideration of the recently instituted Section of Terrestrial Magnetism and Electricity of the International Geodetic and Geophysical Union.

THE Marlborough College Natural History Society, which has been in existence for fifty-six years, is a notable example of the good work which an association of schoolboys can perform under competent guidance. The report of the society for 1919 announces the retirement from the post of president of Mr. J. C. Alsop, who carried on the work with success during the period of the war. In botany 205 species, in ornithology 85, and in entomology 223 have been recorded. Lichenology shows a good record, though the subject has been little worked in this country, but the monograph on British species recently published by the British Museum and edited by Miss A. L. Smith may stimulate interest. A good course of lectures delivered by eminent specialists and numerous papers read by members during the year form an interesting feature of the report, which is carefully prepared, and furnishes a good example for the authorities of other schools in Great Britain.

DR. CHARLES SINGER has reprinted an address delivered before the British Academy (Proceedings, vol. ix.) on "Early English Magic and Medicine." The history of medicine is sharply divided into the Dark Age period and that which followed the arrival of the Arabian learning, the remnant of Greek science which survived in the Moslem world. Dr. Singer deals only with the pre-Arabian material. In England the latter has survived from two channels, manuscripts and folk-lore. Greek medicine reached the barbarian peoples of the West at a time when the scientific system of Greece was in complete decay, and it came through Latin channels. In dealing with magic Dr. Singer remarks that ecclesiastical elements are found throughout the whole corpus of Anglo-Saxon medicine and magic. Native Teutonic magic and medicine may be distinguished from imported elements of classical, ecclesiastical, or Salernitan origin by the presence of four characteristic elements: the doctrine of specific venoms, the doctrine of the Nines, the doctrine of the worm as a cause of disease, and, lastly, the doctrine of the elf-shot—all of which are fully described. "The Celtic influence in the Anglo-Saxon material is elusive and yet pervasive, but the difficulty of tracing it may be a result of the common heritage of the two cultures and the common external influences to which they were both subjected."

MESSRS. SUTTON AND SONS, Reading, have published an interesting contribution to the literature on seed electrification. This bulletin (No. 11) presents the results of a number of germination and field tests carried out in 1919 with seeds of carrot, swede, cabbage, and mangold. The best-known process of seed electrification, viz. the Wolfryn process, consists in immersing the seeds in a solution either of common salt and water or of calcium chloride and water, through which an electric current is then passed. After this treatment the seeds are dried at a temperature of 100° F., and they are then ready for sowing. Obviously two processes are here involved, seed immersion and seed electrification, and the Reading experiments were designed primarily to test the value of the Wolfryn process, and secondarily, if there are advantages, to decide whether they are due to the immersion, to the electrification, or to both agents combined. Tests were made with untreated seeds, with seeds electrified by the Wolfryn process, with seeds soaked in a solution of sulphate of ammonia, and with seeds soaked in a solution of salt and water, the strength of the solution being the same as that used in the Wolfryn process. After immersion the seeds were dried at 100° F. and then sown. Regarding the tests as a whole, they do not reveal any advantage from seed electrification, the only possible exception occurring in the case of mangolds, where the germination of the electrified seed was 94 per cent., compared with 82 per cent. for the untreated seed and 86 per cent. for the seed soaked in the salt solution, while in the field tests the electrified mangold seed yielded 62 lb. per pole more than the untreated seed. In all other cases either the electrified seed gave a lower yield than the seeds treated in other ways, or the increase following electrification was so small as to be negligible.

The Government of India is now considering the principles under which the census of 1921 is to be undertaken synchronously with those of the nations of civilised Europe. Hitherto the reports have included much valuable anthropological material, but this is found to be in practice of little value to the bureaucracy. The time, it is said, has come for a scientific demographic census, one which collects such statistical details as will throw light on all the problems of population, such as the causes which increase or decrease peoples or sections of peoples in numbers, by sexes, in efficiency and capacity for progress. More, we want to know the real causes why the Moslem population increases at a faster rate than the Hindu, and the causes of the excess of male births, of the variability of sex mortality, and of polygyny and polyandry. To carry out such a scheme it will be necessary to work in close collaboration with European experts. In former census reports the mass of anthropological material made them a happy hunting-ground for European workers. If future reports are to be confined to inquiries of a sociological kind, we trust that efforts will at once be made to continue the ethnological survey on wider lines. The scheme initiated by Lord Curzon has led to little result; and while Madras, the Central Provinces, Burma, and the Punjab have issued some important publications, practically nothing seems to have been done after twenty years' incubation in Bombay, Bengal, and the United Provinces.

The *Meteorological Magazine* for April contains an article on "Climates of the British Empire Suitable for the Cultivation of Cotton," by Mr. C. E. P. Brooks. Details with respect to rainfall and temperature of a cotton-growing climate are given for various British Possessions and Colonies. It is stated that the essential features are: (1) The mean annual temperature should not be below 60° F. (2) The mean temperature of the warmest month should exceed 80° F., or the mean of the three warmest months should exceed 77° F. to get the best results; this condition, however, is not so important as the first. (3) The interval between killing frosts (or droughts) should be at least 200 days. (4) The annual rainfall should not exceed about 60 in. for good crops, though cotton of a poorer quality can be grown in much wetter climates; unless irrigation is possible, the annual fall should not be less than 23 in. (5) There must be plenty of bright sunshine. A dull and humid atmosphere is particularly unfavourable to the cotton plant.

Mr. G. W. Lamplugh's address as president of the Geological Society of London appears in the Quarterly Journal of that Society, vol. lxxv., part 1, published in January, 1920. Its theme is that studies of the thicknesses of English sedimentary series show that an anticlinal uplift is the sequel to deposition in a gradually deepening trough. Hence the greatest thicknesses of strata are now found near the escarpments, from which the beds thin away towards the margins of the former trough. The Weald, the Jurassic uplands, the Trias, and most of our Carboniferous rocks are cited as examples. The Jurassic beds beneath the Weald still retain the synclinal structure; but the "partial recovery" of the trough is marked as we pass upwards through the Wealden series to the Chalk. The sections given provide much material for thought.

The latest addition to the series of Special Reports on the Mineral Resources of Great Britain, issued by the Geological Survey, is vol. xv. on "Arsenic and Antimony Ores," by Henry Dewey. As neither of these substances is produced in any very important quantities in this country, the report is necessarily a brief one, though the subjects are treated quite thoroughly. In the case of each metal there is given a general account of the mode of occurrence and of the distribution of its ores, followed by a detailed description of all the mines that have produced any noteworthy quantity. There is practically no antimony at all produced in Great Britain, but Cornwall and Devon still rank as relatively important contributors to the world's output of arsenic, much of this being obtained as a by-product from Cornish tin-mines. As has been pointed out by Sir Aubrey Strahan, the main value of this report lies in the fact that it has brought together in a convenient and readily accessible form a quantity of information previously scattered through a number of publications, which is thus rendered readily available to those interested in the various industries which make use of the metals here discussed or of their compounds.

The April issue of the Journal of the Institution of Electrical Engineers contains the paper read by Mr. R. S. Whipple at the joint meeting of the institution and the electro-therapeutics section of the Royal Society of Medicine on electrical methods of measuring body temperatures. After describing the modern resistance thermometer and the thermo-electric couple methods of measuring temperature, he comes to the conclusion that for ordinary work records of body temperature and its variation can best be obtained by means of a resistance thermometer placed in the rectum. For more accurate work a thermo-electric couple with a photographic recorder must be used, especially if rapid or minute variations of temperature are to be detected. The resistance thermometer may be made of platinum wire of about 1/20 mm. diameter, have a resistance of about 140 ohms, and be used with a moving-coil galvanometer in a resistance bridge with arms of about the same resistance. A suitable thermo-electric couple is provided by copper and constantan, an alloy of about 60 per cent. copper and 40 per cent. nickel. A moving-coil galvanometer of coil resistance 10 ohms or less is suitable, with a balancing resistance placed in series to give a convenient scale deflection.

IT is a sign of the spirit which we have so long worked to encourage, to find on opening last month's issue of *Beama*, the excellently produced journal of the British Electrical and Allied Manufacturers' Association, an article by Mr. E. B. Wedmore urging the importance of co-operative scientific research. Mr. Wedmore points out how the war has taught us the value of concerted action, and shows that combined rather than individual research facilities are particularly necessary in view of the present shortage of scientifically trained technical men. Among articles which follow, indicating some of the enormous industrial structures already raised on foundations of scientific endeavour, is one by Mr. W. E. Hughes sketching the many uses to which the electro-deposition of metals has been put. An interesting example is the building up of worn engine parts, such as crankshafts, by deposits of iron—a practice developed by the Royal Air Force in face of some difficulty during the war. The author, however, points out how the serious lack of educational facilities has hampered British progress in these branches of electro-metallurgy. Another interesting article by Mr. A. B. Searle deals with the preparation of tungsten and its important uses in the filaments of modern incandescent lamps and of the three-electrode ionic valves upon which many of the recent developments in wireless telegraphy are based. Notwithstanding the large amount of research that has led up to the present processes, the author characterises them as "making the best of a bad job." If means could be found for melting the purified tungsten economically, the quality of the filaments would be greatly improved. Unfortunately, however, this cannot be done at present, he concludes, owing to the extraordinarily high melting point of the metal (more than 3000° C.) and the difficulty of heating it to this temperature out of contact with carbon.

THAT "small things often very considerably affect the destinies of great ones" is the appropriate motto chosen to introduce a paper on lubricants read by Mr. G. F. Robertshaw at a meeting of the Institution of Petroleum Technologists on April 19. One object of the paper was to urge a plea for uniformity in the methods of examining lubricating oils. At present there is a diversity of practice which is liable to produce confusion and uncertainty in judging lubricants from the physical and chemical data obtained in testing them. For instance, there are half a dozen kinds of instruments used for determining the viscosity of oils, and the results are expressed in different terms, depending upon the particular viscometer employed. Hence an appeal is made that the absolute viscosity, or some convenient multiple or sub-multiple of it, should uniformly be used as the standard method of expression. The paper also, it may be noted, affords a convenient reference to the somewhat extensive literature upon lubrication. Without compiling a complete bibliography, the author directs attention to many useful sources of information, historical, scientific, and practical. On the question of "oiliness"—a property possessed by good lubricants which at present cannot be specified in definite terms—it is remarked that this property is not necessarily proportional to viscosity. Whilst the late Sir Boverton Redwood's dictum is still true, that viscosity is our most valuable test of lubricating quality, there yet remains the fact that for the same viscosity the fixed vegetable and animal oils have usually a greater "oiliness" than mineral oils.

A NEW view of the nascent state is put forward by C. Zenghelis in the *Comptes rendus* of the Paris Academy of Sciences for April 12. Experiments are described which show that the chemical activity of such gases as hydrogen, oxygen, nitrogen, or carbon monoxide is increased by bringing them in contact with solutions in very minute bubbles. This fine state of division is obtained by forcing the gas through cartridges of paper, the pressure inside the cartridge being so adjusted that the gas does not bubble through, but reacts with the dissolved body in the pores of the paper. Before each experiment a blank was made with each cartridge alone to prove that the paper had no action on the solution. Under these conditions hydrogen was proved to reduce mercuric chloride to calomel, potassium nitrate to nitrite, carbon dioxide to formaldehyde, and substances giving a sugar reaction. With oxygen gas ammonia was oxidised to nitrous acid, and methyl alcohol to formaldehyde. With nitrogen and hydrogen sufficient ammonia was produced in half an hour to give a reaction with Nessler solution. Carbon monoxide reduced iodic acid and sodium molybdate. All these reactions took place at ordinary temperatures. Fuller details of the experiments will be published later.

PROF. A. N. WHITEHEAD is publishing almost immediately through the Cambridge University Press the Tarner lectures delivered by him in November last. The volume will be entitled "The Concept of Nature," and form a companion to the same author's "Enquiry Concerning the Principles of Natural Knowledge." It will, however, be less mathematical than the earlier work.

THE Cambridge University Press announces the publication in June of "The Influence of Man on Animal Life in Scotland: A Study in Faunal Evolution," by J. Ritchie. As the title implies, the book will deal with the bearing of man upon the character and composition of the fauna of Scotland. It will be fully illustrated and contain eight maps.

THE latest catalogue (No. 401) of Mr. Francis Edwards, 83 High Street, Marylebone, W.1, gives particulars of 757 books on the Far East—China, Japan, and the Malay Archipelago; also of the Far North-East of Asia, including Siberia and Kamtchatka. Many of the works are scarce, but the majority are listed at greatly reduced prices. The catalogue will be sent free upon request.